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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/690,993	10/17/2000	John Eric Kleider	GE04563	3158

22863 7590 11/03/2003

MOTOROLA, INC.
CORPORATE LAW DEPARTMENT - #56-238
3102 NORTH 56TH STREET
PHOENIX, AZ 85018

EXAMINER

LIU, SHUWANG

ART UNIT	PAPER NUMBER
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2634

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DATE MAILED: 11/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/690,993

Applicant(s)

KLEIDER ET AL.

Examiner

Shuwang Liu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5,6,9-11 and 30 is/are allowed.
- 6) ☒ Claim(s) 1-4,7,8,12,13 and 22-24 is/are rejected.
- 7) ☒ Claim(s) 14-21 and 25-29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection because the amendments.

2. Applicant's arguments regarding claims 22-24 filed on September 02, 2003 have been fully considered but they are not persuasive.

The Examiner has thoroughly reviewed Applicant's arguments but firmly believes that the cited reference reasonably and properly meet the claimed limitation as rejected.

Applicant's argument – Hughes-Hartogs "measures the equivalent noise level at each carrier frequency" and not the signal to noise ratio. Therefore, the reference '227 "fails to make known obtaining a signal-to-noise ratio for each subchannel in said plurality of subchannels within said wideband channel."

Examiner's response – As discloses by Hughes-Hartogs in column 2, line 64- column 3, line 2, column 5, lines 47-55 and figure 5, the reference teaches obtaining a signal-to-noise ratio for each subchannel in said plurality of subchannels within said wideband channel.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Hughes-Hartogs (US 4,679,227).

As shown in figures 3 and 5-7, Hughes-Hartogs discloses an orthogonal frequency-division multiplex (OFDM) communication system utilizing a plurality of subchannels, comprising:

(1) regarding claim 22:

an OFDM receiver (see figure 3) configured to obtain a signal-to-noise ratio (SNR) for each subchannel in said plurality of subchannels within said wideband channel (see figure 5, column 9, line 49-62 and column 11, lines 11-16); and

an OFDM transmitter (see figure 3) in communication with said OFDM receiver and configured to transmit OFDM data so that said OFDM receiver receives said OFDM data in each subchannel within said plurality of subchannels within said wideband channel at one of zero subchannel signal level (0 bit), an intermediate subchannel signal level (2-6 bits), and a maximum subchannel signal level in response to said SNR therein (8 bits) (column 11, lines 11- 27).

(2) regarding claim 23:

wherein said OFDM receiver comprises:

a scanning section (column 11, lines 4-8) configured to scan each of said subchannels in said plurality of subchannels within said wideband channel;

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a detection section coupled to said scanning section and configured to obtain said SNR for each of said subchannels (column 8, lines 21-28 and column 9, lines 18-62);and

an evaluation section coupled to said detection section and configured to designate as a clear subchannel each of said subchannels having a SNR greater than a least-SNR requirement (figure 5, column 9, lines 63-67 and column 17, lines 16-34).

(3) regarding claim 24:

wherein said OFDM transmitter is configured to transmit said OFDM data so that said OFDM receiver receives said OFDM data in each of said clear subchannels at said maximum subchannel signal level (see figure 7 for maximum signal level).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4, 7, 8, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Su et al. (IEEE, 1998, see IDS, paper #2) in view of Kumar (US 5,748,677).

Su et al. discloses a method of orthogonal frequency-division multiplex (OFDM) communication via a plurality of subchannels, comprising:

(1) regarding claims 1 and 12:

producing a modulation profile of said wideband channel, wherein said modulation profile is responsive to a signal-to noise ratio (SNR) for each subchannel in said plurality of subchannels within said wideband channel (Section 2.B, Page 475-476); and

transmitting OFDM data in response to said modulation profile (Section 2, page 474).

Furthermore, Su et al. discloses that the transmitting activity transmits said OFDM data over more than one user channel (last paragraph of section 3) as recited in claim 12.

Su et al. discloses all of the subject matter as described above except for specifically teaching receiving a reference signal transmitted over each subchannel in said plurality of subchannels within said wideband channel as claimed.

Kumar, in the same field of endeavor, teaches a system comprising receiving a reference signal transmitted over each subchannel in the plurality of subchannels within said wideband channel (see figures 1-7 and abstract).

It would be desirable to establish a synchronization or carrier frequency tracking in the communication system by using a reference signal transmitted by the transmitter (column 6, lines 24-27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the reference signal as taught by Kumar in the OFDM system of Su et al. in order to allow the receiver to recover the data

transmitted from the transmitter. In doing so, the synchronization is established so as the demodulation system achieves a proper operation.

Su et al. further discloses :

(2) regarding claim 2:

wherein said producing activity comprises:

establishing a least-SNR requirement (step 0 in section 3, page 476);

determining said SNR for each of said subchannels in said plurality of subchannels within said wideband channel (steps 1-3 in section 3, page 476); and

designating each of said subchannels having an SNR greater than said least-SNR requirement as a clear subchannel (step 4 in section 3, page 476).

(3) regarding claim 3:

wherein said producing activity additionally comprises:

establishing a least-quality-of-service requirement (section 2.B after equation (8), page 475); and

optimizing a throughput of each of said clear subchannels in which a quality-of-service is greater than said least quality-of-service requirement (section 2.B after equation (8), page 475 and equations 9 2, 3 and 4).

(4) regarding claim 4:

wherein said producing activity additionally comprises:

establishing a least-throughput requirement (section 2.B after equation (8), page 475 and abstract); and

optimizing a quality-of-service of each of said clear subchannels in which a throughput is greater than said least throughput requirement (section 2.B after equation (8), page 475 and equations 9 2, 3 and 4).

(5) regarding claim 7:

additionally comprising iterating said producing and transmitting activities to track changes in said SNR in each subchannel of said plurality of subchannels within said wideband channel (steps 1-5 on page 476 though section 3 on page 477).

(6) regarding claim 8:

wherein said producing activity comprises:

scanning said wideband channel (steps 1-4, page 476); and

determining said SNR for each of said subchannels in said plurality of subchannels within said wideband channel in response to said scanning activity (steps 1-5 on page 476).

(7) regarding claim 13:

wherein each of the user channels comprises at least one of said subchannels (last paragraph of section 3).

Allowable Subject Matter

1. Claims 5, 6, 9-11 and 30 are allowed.

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2. Claims 14-21 and 25-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

3. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach a method of orthogonal frequency-division multiplex (OFDM) communication via a plurality of subchannels within a noncontiguous wideband channel, said method comprising determining an impeded subchannel each of said subchannels in which said SNR is less than said first least SNR threshold and greater than or equal to a second least-SNR requirement.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shuwang Liu whose telephone number is (703) 308-9556.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin, can be reached at (703) 305-4714.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

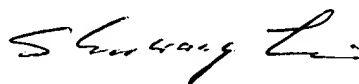
Washington, D.C. 20231

or faxed to:

(703) 872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.



Shuwang Liu
Primary Examiner
Art Unit 2634

October 25, 2003